



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/612,660

07/02/2003

Bo Su Chen

15436.441.3

5518

22913

7590

04/07/2008

WORKMAN NYDEGGER
60 EAST SOUTH TEMPLE
1000 EAGLE GATE TOWER
SALT LAKE CITY, UT 84111

EXAMINER

CONNELLY CUSHWA, MICHELLE R

ART UNIT

PAPER NUMBER

2874

MAIL DATE

DELIVERY MODE

04/07/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/612,660	Applicant(s) CHEN ET AL.	
	Examiner MICHELLE R. CONNELLY CUSHWA	Art Unit 2874	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 December 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 and 21-42 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 and 21-42 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

Applicant's Amendment filed December 7, 2008 has been fully considered and entered.

The indicated allowability of claims 5, 7, 9, 26-31 and 41 is withdrawn in view of the following reference(s): Shimada et al. (US 2002/0162338 A1) and Gaebe (US 5,684,901). Rejections based on the reference(s) follow.

Examiner's Note

Upon further review within the office, it has been determined that the limitation "an aspherical lens configured to directly contact an optical fiber" does not require the aspherical lens to physically contact the optical fiber. A direct optical contact, i.e. an optical contact between an aspherical lens and an optical fiber with no intervening elements therebetween is considered to be sufficient to meet this limitation.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 and 21-24 are rejected under 35 U.S.C. 102(b) as being anticipated by Gaebe (US 5,684,901).

Regarding claim 1; Gaebe discloses an optical coupler (see Figure 3), comprising:

- a spherical lens (ball lens, 32);
- an aspherical lens (48) configured to directly contact an optical fiber (fiber, 20, shown in Figures 1 and 2; see column 3, lines 47-48); and
- wherein the lenses and the optical fiber are situated on a common optical axis.

Regarding claims 21-23; Gaebe discloses an optical coupler (see Figure 3) comprising:

- a means (the spherical ball lens, 32) for spherically focusing light (11) from a light source (laser, 10; see Figure 3, the cavity of the laser may be considered to be a vertical cavity and the laser emits light, 11, from a surface);
- a means (the aspherical lens ,48) for aspherically focusing light from the means for spherically focusing light; and
- an optical medium (fiber and/or air surrounding fiber comprise optical mediums; the optical medium may be a single mode optical fiber, see column 1, lines 11-19) configured to guide aspherically focused light from the means for aspherically focusing light, the optical medium optically contacting the means for aspherically focusing light;
- wherein the means for spherically focusing light, the means for aspherically focusing light and the optical medium are on a common optical axis.

Regarding claim 24; the means for spherically focusing light (32) conveys more light power than the means for aspherically focusing light (48).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2-18, 25-31, 41 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gaebe (US 5,684,901).

Regarding claims 2-4, 8, 11-18 and 25; Gaebe discloses an optical coupler (see Figure 3) comprising:

- a spherical ball lens (32); and
- an aspherical lens (48);
- wherein the spherical ball lens and the aspherical lens are situated in the same optical path on a common optical axis;
- wherein that the optical coupler is for coupling to an optical fiber (20; see Figures 1 and 2, the title of the patent, the abstract, and column 4, lines 4-31);
- wherein the optoelectronic element (10) is a vertical cavity surface emitting laser light source (see Figure 3; the cavity of the laser may be considered to be a vertical cavity and the laser emits light, 11, from a surface);

- wherein the optical medium may be a single mode optical fiber (see column 1, lines 11-19); and
- wherein a window (aperture of laser, 10, through which beam, 11, passes) is situated between the light source (10) and the spherical lens (32).

Gaebe discloses all of the limitations of these claims as applied above, except for specifically stating that the spherical lens comprises a glass material or that the aspherical lens comprises a non-glass or plastic material.

Gaebe does not suggest that the lenses (32 and 48) are made of any particular material, thereby indicating a lack of criticality in the particular material forming the lenses.

Spherical and aspherical lenses are both known to be formed by either glass and/or plastic materials in the art. Plastic materials provide improved mechanical consistency, lower component manufacturing costs for complicated structures due to molding techniques that are employed in the art, and a reduction in weight, which can reduce additional costs associated with shipping and/or incorporating the elements (in this case lenses) in optical systems. Ball or spherical lenses are simple shapes that are easily made from glass materials, which exhibit well known standard properties, and advantageously have improved heat tolerances and offer higher refractive index values, when compared to plastics. It is noted that both glass spherical lenses and plastic aspherical lenses are well known, commonly used, and readily available in the art.

Therefore, one of ordinary skill in the art would have found it obvious to use a glass ball spherical lens in the invention of Gaebe and thereby provide a lens with well known standard properties, good heat tolerance, and a high refractive index, since such lenses are well known, commonly used, and readily available in the art. Additionally, one of ordinary skill in the art would have found it obvious to use a plastic aspheric lens in the invention of Gaebe and thereby provide a lens with a more complicated structure that has low manufacturing costs and reduced weight, since such lenses are well known, commonly used, and readily available in the art.

Regarding claims 5-7, 41 and 42; Gaebe does not explicitly state that the aspherical lens is convex or concave. However, both convex and concave aspheric lenses are well known and commonly employed for optical coupling in the art. One of ordinary skill in the art would have found it an obvious matter of design choice to use the aspheric lens type that provides the best coupling results thereby improving the coupling efficiency of the optical device of Gaebe, including either a convex or a concave aspheric lens having a side that is substantially flat, as both are known alternatives to each other and the use of either type is well within the level of ordinary skill in the art.

Further regarding claims 7-10; applicant is claiming the product including the process of making the aspherical lens and therefor claims 7-10 are of "product-by-process" nature. The courts have been holding for quite some time that: the determination of the patentability of product-by-process claim is based on the product itself rather than on the process by which the product is made. *In re Thrope*, 777 F. 2d

Art Unit: 2874

695, 227 USPQ 964 (Fed. Cir. 1985); and patentability of claim to a product does not rest merely on a difference in the method by which that product is made. Rather, it is the product itself which must be new and unobvious. Applicant has chosen to claim the invention in the product form. Thus a prior art product which possesses the claimed product characteristics can anticipate or render obvious the claim subject matter regardless of the manner in which it is fabricated. A rejection based on 35 U.S.C. section 102 or alternatively on 35 U.S.C. section 103 of the status is eminently fair and acceptable. *In re Brown and Saffer*, 173 USPQ 685 and 688; *In re Pilkington*, 162 USPQ 147. As such no weight is given to the process step "molded" recited in claims 7 and 8, or the process step "injection molded" recited in claims 9 and 10.

Regarding claims 13-16; a window (aperture of laser, 10, through which beam, 11, passes) is situated between the light source (10) and the spherical lens (32).

Regarding claims 26-31; the invention of Gaebe et al. as disclosed above performs the method as described in claims 26-31.

Claims 32-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimada et al. (US 2002/0162338 A1).

Regarding claim 32; Shimada et al. discloses an optical coupler comprising:

- an aspherical lens (13) on an optical axis;
- a spherical lens (ball lens, 14) on the same optical axis;
- wherein the aspherical lens immediately precedes or follows an optoelectronic element (laser, 11); and

- wherein the spherical lens immediately precede or follows an optical medium (fiber, 15).

Shimada et al. does not state that the aspherical lens (13) is concave. However, concave aspherical lenses are well known and commonly used in the art and one of ordinary skill in the art would have found it an obvious design choice to use a concave aspherical lens to achieve the desired optical coupling and improve efficiency in the device of Shimada et al., since concave aspherical lenses are known alternative aspherical lenses in the art, and choosing an appropriate aspherical lens is well with in the level of ordinary skill in the art.

Regarding claims 33-36; Shimada et al. discloses all of the limitations as applied above, except for specifically stating that the spherical lens comprises a glass material or that the aspherical lens comprises a non-glass or plastic material.

Shimada et al. does not suggest that the lenses are made of any particular material, thereby indicating a lack of criticality in the particular material forming the lenses.

Spherical and aspherical lenses are both known to be formed by either glass and/or plastic materials in the art. Plastic materials provide improved mechanical consistency, lower component manufacturing costs for complicated structures due to molding techniques that are employed in the art, and a reduction in weight, which can reduce additional costs associated with shipping and/or incorporating the elements (in this case lenses) in optical systems. Ball or spherical lenses are simple shapes that are easily made from glass materials, which exhibit well known standard properties, and advantageously have improved heat tolerances and offer higher refractive index values,

Art Unit: 2874

when compared to plastics. It is noted that both glass spherical lenses and plastic aspherical lenses are well known, commonly used, and readily available in the art.

Therefore, one of ordinary skill in the art would have found it obvious to use a glass ball spherical lens in the invention of Shimada et al. and thereby provide a lens with well known standard properties, good heat tolerance, and a high refractive index, since such lenses are well known, commonly used, and readily available in the art. Additionally, one of ordinary skill in the art would have found it obvious to use a plastic aspheric lens in the invention of Shimada et al. and thereby provide a lens with a more complicated structure that has low manufacturing costs and reduced weight, since such lenses are well known, commonly used, and readily available in the art.

Regarding claim 37; one of ordinary skill in the art would have found it obvious to use a VCSEL as the laser (11) in the invention of Shimada et al. and additionally to use a single-mode or a multi-mode optical fiber as the fiber (15) in the invention of Shimada et al., since both types of devices are well known and commonly employed in the art and it appears that the invention would perform equally well regardless.

Regarding claims 38-40; One of ordinary skill in the art would have found it obvious to replace the laser (11) with a photodetector in order to form an optical receiver to detect light as is known in the art.

Response to Arguments

Applicant's arguments with respect to claims 1-18 and 21-42 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning the merits of this communication should be directed to Examiner Michelle R. Connelly-Cushwa at telephone number (571) 272-2345. The examiner can normally be reached 9:00 AM to 7:00 PM, Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney B. Bovernick can be reached on (571) 272-2344. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Any inquiry of a general or clerical nature should be directed to the Technology Center 2800 receptionist at telephone number (571) 272-1562.

/Michelle R. Connelly-Cushwa/
Patent Examiner
April 2, 2008